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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,299	02/06/2004	Hiroyuki Kagawa	520.38252CC2	4926

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EXAMINER

HON, SOW FUN

ART UNIT

PAPER NUMBER

1772

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/772,299	Applicant(s) KAGAWA ET AL.	
	Examiner Sow-Fun Hon	Art Unit 1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/512,475.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Rejections Withdrawn

1. The obviousness-type double-patenting rejection of claims 1-7 over US 6,423,385, has been withdrawn due to the terminal disclaimer filed 01/09/06.
2. The 35 U.S.C. 102(b) and 103(a) rejections have been withdrawn due to Applicant's amendment dated 01/09/06.

New Rejections

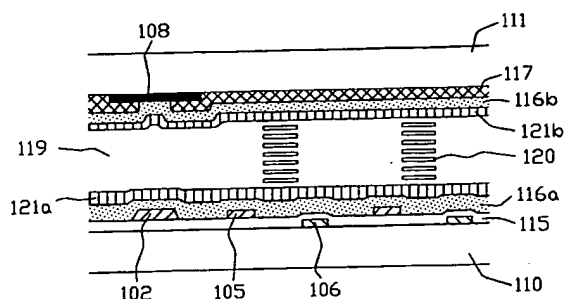
Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1,3, 8, 10, 13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu (US 5,986,735) in view of Okada (EP 0344753A2).

Regarding claims 1, 3, Komatsu teaches a liquid crystal display device comprising: a pair of substrates (column 2, lines 56-58); a liquid crystal layer filled between said pair of substrates (column 2, lines 56-59); and a plurality of pixel electrodes and common electrodes, both of said pixel electrodes and said common electrodes being supported on one of said pair of substrates (110, column 4, lines 32-33, pixel electrodes 105 and common electrodes 106 are arranged at regular intervals, column 4, lines 47-49). See Fig. 4A of Komatsu on the next page.

FIG. 4A



Komatsu teaches that the pixel electrodes and common electrodes are for supplying an electric field to said liquid crystal layer, said electric field having a component which extends substantially in parallel to said one of said pair of substrates (pair of electrodes in the pixel region, applying an electric field parallel to one of the first substrate and second substrate, column 2, lines 56-66). Komatsu teaches that the liquid crystal layer contains 100 % weight of a constituent component, being the only one disclosed, that has a dielectric anisotropy of $\Delta\epsilon < 0$, which is within the claimed range of $\Delta\epsilon \leq 1$.

Komatsu fails to teach that the liquid crystal display device is configured so that a response time between a lowest brightness level and a highest brightness level, or between grey levels, is less than 16.7 ms.

However, Okada teaches a liquid crystal display device (abstract) comprising: a pair of substrates (page 5, line 34); a liquid crystal layer filled between said pair of substrates (page 5, lines 34-39); and a plurality of electrodes (page 5, lines 35-37). Okada teaches that a liquid crystal with $\Delta\epsilon \leq 1$ (page 3, lines 47-52) provides a response time of T_0 (page 4, lines 17-21) on the order of 100 μs (0.1 ms, Fig. 6) for the

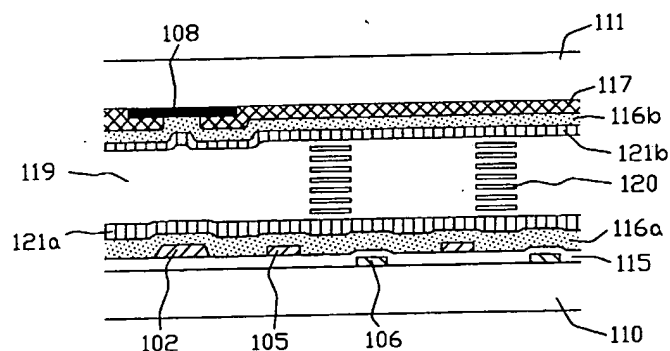
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purpose of providing a fast response time between a lowest brightness level and a highest brightness level.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have configured the liquid crystal display device of Komatsu, so that a response time between a lowest brightness level and a highest brightness level, or between grey levels, is less than 16.7 ms, in order to provide a fast response, as taught by Okada.

Regarding claims 8, 10, 13, 15, Komatsu teaches that said pixel electrodes 105 and said common electrodes 106 are provided in different layers which are supported on said one of said pair of substrates (110, column 4, lines 32-33, pixel electrodes 105 and common electrodes 106 are arranged at regular intervals, column 4, lines 47-49), and are arranged in a substantially nonoverlapping relation in the different layers. See Fig. 4A of Komatsu below.

FIG. 4A



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4. Claims 2, 4, 9, 11, 14, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu in view of Okada, as applied to claims 1,3 above, and further in view of Fergason (US 5,132,815).

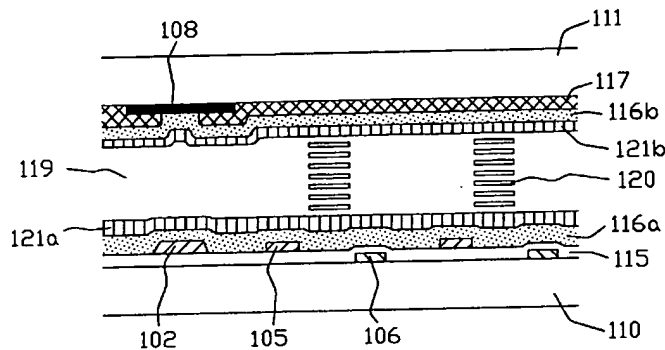
Regarding claims 2, 4, Komatsu in view of Okada teaches a liquid crystal display device comprising: a pair of substrates; a liquid crystal layer filled between said pair of substrates; and a plurality of pixel electrodes and common electrodes formed on one of said pair of substrates for supplying an electric field to said liquid crystal layer, wherein the liquid crystal display device is configured so that a response time between a lowest brightness level and a highest brightness level, or between grey levels, is less than 16.7 ms, and wherein said liquid crystal layer contains 100 % weight percentage of a constituent component with a dielectric anisotropy of $\Delta\epsilon \leq 1$, as described above. Komatsu in view of Okada fails to teach that the component with a dielectric anisotropy of $\Delta\epsilon \leq 1$ is less than 100% weight percentage of the liquid crystal layer, specifically within the range of 40% to 90%.

However, Fergason teaches a liquid crystal color display device where dyes are added to the liquid crystal for the purpose of providing color transmission (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided additional constituent components to the liquid crystal layer of Komatsu in view of Okada, such as dyes so that the component with a dielectric anisotropy of $\Delta\epsilon \leq 1$ is within the claimed range of 40% to 90%, in order to provide a liquid crystal color display device, as taught by Fergason.

Regarding claims 9, 11, 14, 16, Komatsu teaches that said pixel electrodes 105 and said common electrodes 106 are provided in different layers which are supported on said one of said pair of substrates (110, column 4, lines 32-33, pixel electrodes 105 and common electrodes 106 are arranged at regular intervals, column 4, lines 47-49), and are arranged in a substantially nonoverlapping relation in the different layers. See Fig. 4A of Komatsu below.

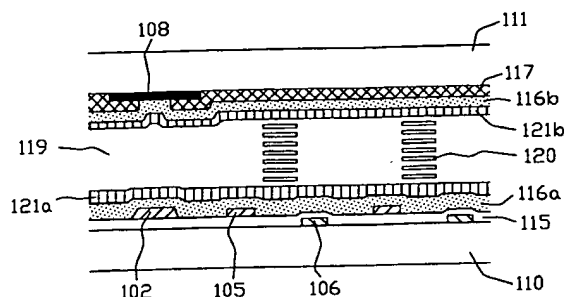
FIG. 4A



5. Claims 5-7, 12, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komatsu (US 5,986,735) in view of Ilcisin (US 5,414,440).

Regarding claim 5, Komatsu teaches a liquid crystal display device comprising: a pair of substrates (column 2, lines 56-58); a liquid crystal layer filled between said pair of substrates (column 2, lines 56-59); and a plurality of pixel electrodes and common electrodes, both of said pixel electrodes and said common electrodes being supported on one of said pair of substrates (110, column 4, lines 32-33, pixel electrodes 105 and common electrodes 106 are arranged at regular intervals, column 4, lines 47-49). See Fig. 4A of Komatsu on the next page.

FIG. 4A



Komatsu teaches that the pixel electrodes and common electrodes are for supplying an electric field to said liquid crystal layer, said electric field having a component which extends substantially in parallel to said one of said pair of substrates (pair of electrodes in the pixel region, applying an electric field parallel to one of the first substrate and second substrate, column 2, lines 56-66). Komatsu teaches that the liquid crystal layer contains 100 % weight of a constituent component, being the only one disclosed, that has a dielectric anisotropy of $\Delta\epsilon < 0$, which is within the claimed range of $\Delta\epsilon \leq 1$. Komatsu fails to teach that said liquid crystal layer has a birefringence Δn and a dielectric anisotropy $\Delta\epsilon$, which satisfy the condition $\Delta n/\sqrt{\Delta\epsilon} \leq 5.5 \times 10^{-2}$.

However, Ilcisin teaches a liquid crystal display device comprising: a pair of substrates (24, 26, column 6, lines 10-20); a liquid crystal layer (column 28, lines 21-25) filled between said pair of substrates; and a plurality of electrodes for supplying an electric field to said liquid crystal layer, wherein said liquid crystal layer has a dielectric anisotropy $\Delta\epsilon$ of less than about 1.0 (column 6, lines 25-30), which is within the claimed range of $\Delta\epsilon \leq 1$, and being the only liquid crystal layer component disclosed, is a constituent component of 100 % weight percentage of the liquid crystal layer. Ilcisin

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teaches that the liquid crystal layer has a dielectric anisotropy $\Delta\epsilon$ of less than about 1.0 (column 6, lines 25-30), which is within the claimed range of $\Delta\epsilon \leq 1$, and that the birefringence Δn is less than 0.08 (column 6, lines 25-30). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have satisfied the claimed condition of $\Delta n/\sqrt{\Delta\epsilon} \leq 5.5 \times 10^{-2}$ when the birefringence Δn is close to 0 or when $\Delta\epsilon$ is a large negative number, well within the requirements of Ilcisin, for the purpose of providing the desired combination of low birefringence and negative dielectric anisotropy for the desired display characteristics.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have provided the liquid crystal layer of Komatsu with a birefringence Δn and a dielectric anisotropy $\Delta\epsilon$, which satisfy the condition $\Delta n/\sqrt{\Delta\epsilon} \leq 5.5 \times 10^{-2}$, in order to provide the desired combination of low birefringence and negative dielectric anisotropy, as taught by Ilcisin.

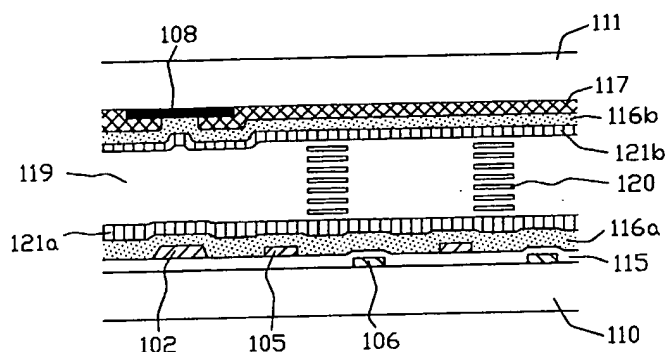
Regarding claims 6-7, Komatsu fails to disclose that the distance L between said pixel electrodes 105 and said common electrodes 106 satisfies the condition of $L \times \Delta n/\sqrt{\Delta\epsilon} \leq 0.55 \mu\text{m}$, or $L \times \Delta n/\sqrt{\Delta\epsilon} \leq 0.4 \mu\text{m}$.

However, Komatsu teaches that layer 116a has a thickness of about 1 μm (900 angstroms, column 4, lines 62-68), which is larger than the thickness of layer 15, as shown in Fig. 4A of Komatsu, on the next page, which determines the distance L between said pixel electrodes 105 and said common electrodes 106. Thus, the distance L between said pixel electrodes 105 and said common electrodes 106,

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satisfies the condition of $L \times \Delta n / \sqrt{\Delta \epsilon} \leq 0.55 \mu\text{m}$, or $L \times \Delta n / \sqrt{\Delta \epsilon} \leq 0.4 \mu\text{m}$ for the liquid crystal display device of Komatsu in view of Ilcisin.

FIG. 4A



Regarding claims 12, 17, Komatsu teaches that said pixel electrodes 105 and said common electrodes 106 are provided in different layers which are supported on said one of said pair of substrates (110, column 4, lines 32-33, pixel electrodes 105 and common electrodes 106 are arranged at regular intervals, column 4, lines 47-49), and are arranged in a substantially nonoverlapping relation in the different layers. See Fig. 4A of Komatsu shown above.

Response to Arguments

7. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number is (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (571)272-1498. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

S. Hon

Sow-Fun Hon

02/15/06

[Signature]

HAROLD PYON

SUPERVISORY PATENT EXAMINER

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2/20/06